

IN THE CLAIMS:

1. (Currently Amended) A system for providing an automatic reply to a first electromagnetic signal comprising:

first means for receiving said first electromagnetic signal;

second means for analyzing said electromagnetic signal to identify a format type of the received signal and provide data with respect thereto;

third means responsive to said data for synthesizing a second electromagnetic signal, said second signal being substantially identical to and electrically independent of said first signal; and

fourth means for automatically transmitting said second electromagnetic signal.

2. (Original) The invention of Claim 1 further including a wake-up circuit.

3. (Original) The invention of Claim 1 wherein said first and second electromagnetic signals are radio frequency signals.

4. (Original) The invention of Claim 3 wherein said first means is a radio frequency receiver.

5. (Original) The invention of Claim 4 wherein said radio frequency receiver is a narrow band receiver or a narrow band mode of a variable bandwidth receiver.

6. (Original) The invention of Claim 4 wherein said first and said second means comprise means for tracking said first electromagnetic signal.

7. (Original) The invention of Claim 6 wherein said second means includes a down converter.

8. (Original) The invention of Claim 7 wherein said down converter includes a first mixer driven by a local oscillator circuit.

9. (Original) The invention of Claim 8 wherein said second means further includes a programmable filter connected to the output of said mixer.

10. (Original) The invention of Claim 9 wherein said second means further includes an analog to digital converter connected to the output of said filter, to include a programmable data rate analog to digital converter.

11. (Original) The invention of Claim 10 wherein said second means further includes a digital signal processor connected to the output of said analog to digital converter.

12. (Original) The invention of Claim 11 wherein said second means includes a data processor.

13. (Original) The invention of Claim 12 wherein said data processor includes a microprocessor.

14. (Original) The invention of Claim 13 wherein said second means includes software adapted for execution by said microprocessor.

15. (Original) The invention of Claim 14 wherein said software includes code for tracking said first electromagnetic signal and providing said data with respect thereto.

16. (Original) The invention of Claim 14 wherein said software includes code for identifying a timing characteristic of said first electromagnetic signal and providing said data with respect thereto.

17. (Original) The invention of Claim 14 wherein said software includes code for identifying a format of said first electromagnetic signal and providing said data with respect thereto.

18. (Original) The invention of Claim 1 wherein said third means includes a data processor.

19. (Original) The invention of Claim 18 wherein said data processor includes a microprocessor.

20. (Original) The invention of Claim 19 wherein said third means includes software adapted for execution by said microprocessor.

21. (Original) The invention of Claim 20 wherein said third means includes a digital signal processor.

22. (Original) The invention of Claim 21 wherein said digital signal processor is a field programmable gate array.

23. (Original) The invention of Claim 21 wherein said third means further includes a digital to analog converter.

24. (Original) The invention of Claim 23 wherein said third means further includes a programmable filter.

25. (Original) The invention of Claim 1 wherein said fourth means includes an up converter.

26. (Original) The invention of Claim 1 wherein said up converter includes a mixer driven by a local oscillator circuit.

27. (Original) The invention of Claim 1 wherein said fourth means includes means for transmitting said second electromagnetic signal in response to receipt of said first electromagnetic signal.

28. (Original) The invention of Claim 1 wherein said second means includes means for transmitting said second electromagnetic signal during a predetermined time interval.

29. (Previously Presented) The invention of Claim 1 wherein said second means includes means for transmitting said second electromagnetic signal during a time interval based on said analysis of said first electromagnetic signal.

30. (Original) The invention of Claim 1 wherein said second means includes means for transmitting said second electromagnetic signal during a substantially random time interval.

31. (Original) The invention of Claim 1 further including fifth means for receiving user data via an external interface.

32. (Original) The invention of Claim 31 further including means for encoding data in said second signal in response to said user data.

33. (Original) The invention of Claim 32 wherein said user data includes voice data.

34. (Original) The invention of Claim 32 wherein said user data includes video data.

35. (Original) The invention of Claim 32 wherein said user data includes position data.

36. (Original) The invention of Claim 35 wherein said position data is Global Positioning System data.

37. (Original) The invention of Claim 31 further including means for extracting user data from said first electromagnetic signal and outputting said user data via said external interface.

38. (Original) The invention of Claim 1 wherein said first electromagnetic signal is optical.

39. (Original) The invention of Claim 38 wherein said first electromagnetic signal is infrared.

40. (Original) The invention of Claim 1 wherein said second electromagnetic signal is optical.

41. (Original) The invention of Claim 40 wherein said second electromagnetic signal is infrared.

42. (Currently Amended) A digital radio frequency tag comprising:  
a radio frequency receiver adapted to receive a first radio frequency signal;  
a data processor connected to said receiver and adapted to analyze the first radio signal to identify a format type thereof and compare the format type thereof to a database of signals and provide data in response to said first radio frequency signal with respect thereto;

a signal generator adapted to synthesize a second electromagnetic signal in response to said data, said second radio frequency signal being substantially identical to and independent of said first signal; and

a radio frequency transmitter adapted to transmit said second radio frequency signal.

43. (Currently Amended) A method for providing an automatic reply to a first electromagnetic signal including the steps of:

receiving said first electromagnetic signal;  
analyzing said electromagnetic signal to identify a format type of the received signal and provide data with respect thereto;  
synthesizing a second electromagnetic signal in response to said data, said second signal being substantially identical to and electrically independent of said first signal; and  
automatically transmitting said second electromagnetic signal.

44. (Previously Presented) The invention of Claim 1 further including means for comparing the format of the received signal to a database and providing an output in response thereto.

45. (Currently Amended) A system for providing an automatic reply to a first electromagnetic signal comprising:

means for receiving a surveillance radar signal;  
means for recognizing the a format type of said signal;  
means for decoding data encoded on said radar signal; and  
means for synthesizing a modified radar signal in response to the recognized format of said signal, said modified signal being a low probability of intercept signal and being electrically independent of said received signal.

46. (Previously Presented) The invention of Claim 45 further including means for encoding data on said synthesized signal.

47. (Previously Presented) The invention of Claim 46 further including means for determining a pattern of incident radio frequency energy of said signal in time and frequency.

48. (Previously Presented) The invention of Claim 47 including means responsive to said means for determining a pattern of incident radio frequency energy of said signal in time and frequency for encoding said uplink signal such that it is indistinguishable from energy reflected by surrounding terrain.

49. (New) The invention of Claim 1 wherein said first signal is a synthetic aperture radar signal.

50. (New) The invention of Claim 1 wherein said first signal is a GMTI signal.

51. (New) The invention of Claim 1 further including means for determining a pattern of incident energy in said first signal.

52. (New) The invention of Claim 51 wherein said pattern is determined in time.

53. (New) The invention of Claim 52 wherein said pattern is determined in frequency.

54. (New) The invention of Claim 1 wherein said second means further includes means for estimating time of arrival of pulses in said first signal.

55. (New) The invention of Claim 42 wherein said first signal is a synthetic aperture radar signal.

56. (New) The invention of Claim 42 wherein said first signal is a GMTI signal.

57. (New) The invention of Claim 42 further including means for determining a pattern of incident energy in said first signal.

58. (New) The invention of Claim 57 wherein said pattern is determined in time.

59. (New) The invention of Claim 58 wherein said pattern is determined in frequency.

60. (New) The invention of Claim 42 wherein said tag further includes means for estimating time of arrival of pulses in said first signal.

61. (New) The invention of Claim 43 wherein said first signal is a synthetic aperture radar signal.

62. (New) The invention of Claim 43 wherein said first signal is a GMTI signal.

63. (New) The invention of Claim 43 further including the step of determining a pattern of incident energy in said first signal.

64. (New) The invention of Claim 63 wherein said pattern is determined in time.

65. (New) The invention of Claim 64 wherein said pattern is determined in frequency.

66. (New) The invention of Claim 43 wherein said step of analyzing further includes the step of estimating a time of arrival of pulses in said first signal.

67. (New) The invention of Claim 45 wherein said radar signal is a synthetic aperture radar signal.

68. (New) The invention of Claim 45 wherein said radar signal is a GMTI signal.

69. (New) The invention of Claim 45 further including means for determining a pattern of incident energy in said radar signal.

70. (New) The invention of Claim 69 wherein said pattern is determined in time.

71. (New) The invention of Claim 70 wherein said pattern is determined in frequency.

72. (New) The invention of Claim 45 wherein said means recognizing further includes means for estimating time of arrival of pulses in said first signal.

73. (New) The invention of Claim 1 wherein said system further includes means for providing real time two-way communication.

74. (New) The invention of Claim 42 wherein said tag further includes means for providing real time two-way communication.

75. (New) The invention of Claim 43 further including the step of providing real time two-way communication.

76. (New) The invention of Claim 45 wherein said system further includes means for providing real time two-way communication.

77. (New) A digital radio frequency tag comprising:

first means for receiving and recognizing a signal and automatically synthesizing a reply in response thereto and

second means coupled to said first means for providing real time two-way communication.